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THE UNIVERSITY OF ALBERTA

AN EXAMINATION OF STRESS IN A LEARN TO SKI PROGRAM

BY

© GEOFFREY J. BIRD

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

DEPARTMENT OF PHYSICAL EDUCATION

EDMONTON, ALBERTA

FALL, 1976

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled An Examination of Stress in a Learn to Ski Program

submitted by Geoffrey John Bird

in partial fulfilment of the requirements for the degree of Master of Arts.

.....
Supervisor

.....

.....

Date July 9/76

D E D I C A T I O N

This study is dedicated to my parents who provided me with the opportunity and to Mary-Jean who helped me to realise it.

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ABSTRACT

The purpose of this study was to examine the level of stress operating in a Learn to Ski Program and to interpret this stress in terms of eustress and dys-stress. Four questionnaires were used, each specific to various situations throughout the program. All four inventories administered to a sample of 54 twelve year old boys and girls revealed significant differences in the level of stress as measured at the beginning and at the end of the program, and between each group of low, medium and high trait anxiety.

The findings did not support the eustress -- dys-stress theory which hypothesizes that an individual will seek a level of stress which is pleasant. The stress sought is referred to as eustress and is interpreted in terms of the excitement, enjoyment, interest and fun associated with a particular activity. The results indicated instead that stress was viewed from a negative point of view and that as the level of stress decreased, the level of pleasantness associated with the stress increased.

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1. INTRODUCTION

The thesis of this study is that stress has a positive as well as negative connotation. That in fact stress is an adaptive, motivational factor in sport and physical activity (Martens, 1975; Harris, 1974; Berlin, 1974). This being the case, individuals may be motivated to participate in sport by providing them with activities of a predominantly eustressful nature. Eustress is referred to by Bernard (1968) as the pleasant kind of stress associated with excitement, thrilling experiences, fun, adventure and the release of energy. The possibility exists that a properly directed sport and physical education program could substitute for many of the activities in which youth presently engage that are regarded by today's society as deviant. According to Klapp (1969), youth resorts to deviant behavior in a search for identity. "Leisure is a maze of identity-seeking activities under the aegis of fun" (Klapp, 1969). Sport as a leisure activity could be a valuable tool -- by providing individuals with eustressful activities the societal problem of identity-seeking through deviant behavior could be alleviated or reduced in magnitude. Klausner (1968) contended that play and sport were the only socially acceptable manners in which one can achieve free enjoyment and toleration of stress, while Alderman (1974) stated that sport and physical activity may be a prime mover for achieving and fulfilling such goals.

Prior to 1970 studies by Selye (1956), Lazarus (1966), Levi (1965), Abram (1970), Basowitz (1955), Johnson (1949), and others, related stress and disease. The concensus being that stress should be minimized; if possible totally avoided. Since 1970, further research by Selye (1974), Lazarus (1971), and Levi (1971), as well as studies by Berlin (1974), Harris (1974), and Martens (1975), support the contention that stress, either psychological or physiological, is not necessarily detrimental.

Although the latter theory is gaining acceptance, recent statements in the media by Professor John Howard (1975) lead to the belief that stress is still generally viewed negatively. Howard contends that almost every illness is related to stress. In this light, no attempt has been made as yet to identify stress in terms of eustress and dys-stress. For example, no one has examined the stress encountered by an individual learning to ski or interpreted such stress in terms of pleasantness (eustressful) and unpleasantness (dys-stressful). Similarly, little effort has been made to relate stress to the individual's level of situational anxiety; to measure, for example, the level of stress experience by an individual in various learn to ski situations. Some ambiguity surrounding the terms anxiety and stress has developed from a failure to distinguish between situational anxiety and anxiety proneness.

The Problem

The purposes of this study are:

A. To differentiate situational anxiety (A-State) and anxiety proneness (A-Trait) as proposed by Spielberger (1972), in young beginner skiers.

B. To evaluate the level of stress operating in a Learn to Ski Program and to determine the nature of the stress.

C. To test the following hypotheses:

Ho_1: The level of stress experienced by an individual prior to participation in a Learn to Ski Program is the same at the beginning as at the completion of the program.

$$Ho_1: \ U_1 = U_2$$

Ho_2: All stress experienced in a Learn to Ski Program is dys-stress.

$$Ho_2: U_1 = U_2$$

Ho_3: State and trait anxiety are correlated for each individual regardless of the stress in the situation.

$$Ho_3: \rho_1 = \rho_2$$

Ho_4: An individual's level of trait anxiety will be the same at the completion of a Learn to Ski Program as it was the the beginning of the program. $Ho_4: U_1 = U_2$

Ho_5: The level of stress experienced in specific situations during a Learn to Ski Program is the same in the first and last lesson.

$$Ho_5: \quad U_1 = U_2$$

D. To formulate a more precise and comprehensive hypothesis relating stress to participation in sport, particularly in regard to whether or not such stress is preceived as being pleasant or unpleasant.

Need for the Study

All individuals encounter minor stresses as they grow older, and to develop normal and adaptive behavior some degree of stress is necessary (Levine, 1971). The limits within which one is able to tolerate stress vary from person to person but, in the general sense, the human body and mind are normally able to adapt to the stresses encountered in new situations (Miller and Keane, 1972).

Bernard (1968) referred to stress in terms of eustress and dys-stress. Eustress was conceived of as a pleasant type of emotion typified by excitement, fun, interest, enjoyment and the release of energy; while dys-stress is unpleasant, damaging, and sometimes painful. No effort has been made, however, to support or reject the eustress -- dys-stress theory. In fact, there is still conjecture over whether stress has positive as well as negative aspects. Some researchers (Pichot, 1971; Wolff, 1969; Levine and Scotch, 1970; Oakeshot, 1973; Lazarus, 1971) refer to stress in negative terms only while others (Martens, 1972; Berlin, 1974; Harris, 1974; Selye, 1974; Bernard, 1968) see stress as having both positive and negative attributes. Howard (1975) associates stress with illness and believes that stress is generally viewed negatively.

Hence there is a need to determine whether stress can be both pleasant and unpleasant. This being the case, if as Selye (1974) says, "stress cannot be avoided", one of the functions of sport and physical activity may be in part to provide socially acceptable ways of fulfilling a need for stress.

Delimitations

The sampling of subjects was delimited to 54 twelve year old boys and girls enrolled in the Woodwards' Learn to Ski Program held at Lake Eden Resort, Edmonton, Alberta.

Limitations

The measurement of State and Trait anxiety was limited to Spielberger's State-Trait Anxiety Inventory.

The identification of eustress and dys-stress was limited to the questionnaires - Appendix C and D, pages 68 and 69 respectively.

Definitions

For the purposes of this study, the following definitions will be employed:

Anxiety: a specific emotional state which consists of unpleasant, consciously perceived feelings of nervousness, tension and apprehension, with associated activation or arousal of the autonomic nervous system.

A-State Anxiety: a transitory emotional condition or state of the human organism that varies in intensity and fluctuates over time or situation.

A-Trait Anxiety: relatively stable individual differences in anxiety proneness.

Dys-stress: unpleasant, damaging and sometimes painful type of stress.

Emotions: complex, qualitatively different, feeling states or conditions of the human organism that have both phenomenological and physiological properties.

Eustress: a pleasant type of emotion typified by excitement, fun, interest, enjoyment, thrilling experiences, adventure and the release of energy.

Stress: a very broad class of problems differentiated from other problem areas dealing with any demands which tax the system, be it physiological, social, or psychological, and the response of that system.

2. REVIEW OF THE LITERATURE

With the advent of theories on behaviorism in the early 1900's, research on emotion shifted from the investigation of subjective feeling states to the evaluation of behavioral and physiological variables. Of all the research done, none has led to a generally accepted comprehensive theory on emotion (Spielberger, 1972). After reviewing several hundred related studies, Cattel and Scheier (1961) found more than 300 proposed definitions of emotion. Over the last ten years interest in the general theories of emotion has declined, replaced by a noticeable increase in theory and research on specific emotions; such as aggression, drive, self concept, affiliation (Ogilvie and Tutko, 1969; Atkinson and Raynor, 1974; Atkinson and Birch, 1970; Schachter, 1964) and anxiety (Cattell and Scheier, 1961; Levitt, 1967; Spielberger, 1972; Lamb, 1969; O'Neil, 1969; Sachs and Diesenhaus, 1969). Refinement in the study of individual emotions rather than emotions generally has led to research on the circumstances and conditions that produce changes in specific emotions. One such area of study deals with psychological stress (Selye, 1974; Berlin, 1974; Harris, 1974; Martens, 1972, 1975). Psychologists studying psychological stress see emotion as having "mentalistic" connotations whereas the concept of stress, taken from physics and engineering, is

more objective and scientific.

Lazarus (1966) contends that much of what was previously studied under the rubric of emotion is now considered in terms of psychological stress. Arnold (1960) suggests that the changing emphasis toward theory and research on emotional phenomena is because description and explanation of emotional states do not readily adhere to current scientific method. Though methods have been developed scientifically to measure the physiological and behavioral aspects of emotion, the individual feelings that are consciously experienced in emotional states have been largely neglected. Despite this, objective methods of stimulus/response psychology have helped to clarify the complex physiological and behavioral reactions produced by stressful experimental conditions. The research reveals that stressful situations in sport and physical activity evoke psychological states, which in turm are accompanied by autonomic changes in the physiological states. According to Levi (1967) the basic difference between physiological and psychological stress is that physiological stress usually produces highly stereotyped responses through innate neural and hormonal mechanisms, whereas psychological stress is not invariably followed by a predictable response. The psychological phenomena are identified in athletes as feelings of tension, uneasiness, apprehension, fear and anxiety. The physiological changes

that accompany the psychological feelings are changes in pulse, respiration rate, blood pressure and galvanic skin response (Selye, 1956; Lazarus, 1971; Levi, 1965; Kagan, 1971). These physiological and psychological reactions cannot be defined by stimulus/response operations alone. Personality differences and past experiences should be considered as these dispose subjects to respond to similar stimulus objects and circumstances in different ways. Hence a measure of the individual's general level of anxiety is required in order to account for these differences.

Earlier views on anxiety made a distinction between situational anxiety and anxiety proneness, (Cattell and Scheier, 1961; Lazarus, 1966), where anxiety proneness is a relatively unfluctuating condition of the individual which exerts a constant influence on behavior. Situational anxiety occurs in response to a stimulus and is likely to vary in intensity as a function of the stimulus. Spielberger (1972) has developed a State-Trait Theory of Anxiety in an attempt to integrate Cattell and Scheier's concept of anxiety with the psychological - physiological conception of anxiety. Spielberger's concept of anxiety is comparable in many respects to earlier propositions by Selye (1956), Lazarus (1966), and Freud (1936). Anxiety has been conceived by Spielberger as a specific emotional state which

consists of unpleasant, consciously perceived feelings of nervousness, tension and apprehension, with associated activation or arousal of the autonomic nervous system. The development of the theory distinguishes conceptually and operationally between anxiety as a transitory state and anxiety as a relatively stable personality trait. Spielberger's theory consists of two anxiety constructs: State anxiety (A-State) and Trait anxiety (A-Trait). A-State is . . .

> a transitory emotional condition or state of the human organism that varies in intensity and flucuates over time. This condition is characterized by subjective, consciously perceived feelings of tension and apprehension, and activation of the autonomic nervous system.
>
> (Spielberger, 1972)

The level of A-State will be determined by circumstances that are perceived by the individual to be threatening, irrespective of the actual danger.

A-Trait refers to relatively stable individual differences in anxiety proneness (Spielberger, 1972). A-State is characterized primarily by the intensity of anxiety as an emotional or stressful state at a particular moment in time, while A-Trait is characterized as reflecting individual differences in the frequency and the intensity with which A-States have been manifested in the past, and in the probability that such states will be experienced in the future.

A major task which has been neglected in the State-Trait

Theory of Anxiety is to describe and measure the stressor stimuli that evoke differential levels of A-State in persons who differ in A-Trait. Hence stress is examined in terms of eustress (pleasant stress) and dys-stress (unpleasant stress). To identify eustress and dys-stress from the individual's level of A-State anxiety, a basis for correlating stress with A-State anxiety must be established.

Martens (1972), in contrasting conceptions of stress with Spielberger's definition of A-State anxiety, contends ...

> it is readily apparent that the two concepts are substantially synonymous. Both stress and state anxiety refer to a similar state of the organism resulting from the perception of threat.
>
> (Martens, 1971)

This conclusion was initially proposed by Aiken (1961). In recent literature the term stress has been used more frequently than state anxiety to refer to this state of the organism, while the general term "anxiety" has been used to refer to trait anxiety (Martens, 1972). Concensus that state anxiety and stress are synonymous is based on the precept that both result from the perception of threat. This threat need not necessarily be physical. The thought of danger, or the vicarious experience of thrilling situations like plays, films or stories are instances which will often result in psychological stress (Miller and Keane, 1972). It is obvious that sports impose stress on the human body. Whether

these are physical, psychic or social in nature, is not important with respect to the manner in which the body attempts to resolve these stresses. Ulrich (1960) contended that when an individual participates in sports or physical activity, the homeostatic balance of the body is upset and thus a state of "stress" exists until this balance is restored. As a result, the individual would engage in behaviors which tended to reduce this disequilibrium.

Martens proposes that stress motivates behavior indirectly. For example, in a sport situation the anxiety state or level of stress elicited by fear of failure or fear of physical harm may be accompanied by a strong desire for success, recognition and positive reinforcement. The situation engenders some desire to avoid, but the anticipated positive outcome motivates the individual to approach the situation. Only when stress becomes very intense or when the positive attributes associated with the situation are perceived as highly unattainable or undesirable, will the individual withdraw ... This rarely occurs and within the experimental research has not been given serious attention. Although the desired direction for behavior resulting from high anxiety states is quite clear, actual movement in that direction seldom occurs (Martens, 1971).

A study carried out on scuba divers by Radloff and Helmreich (1969) supports this proposition. The investi-

gators reported that on an objective checklist, the underwater divers' self-rating of fear was highly related to his diving performance. Those aquanauts reflecting low levels of fear spent more time in the water than those indicating higher levels of fear. Also, the time the diver spent socializing and interacting with his mates, determined from objective records of television observations while in their habitat, was also strongly related to his diving performance.

An extension of Martens' theory would see the individual interpreting stress in terms of eustress and dys-stress. If the incidence of eustressful experiences during an activity is greater than the incidence of dys-stressful experiences, the situation would be interpreted as eustressful. If the converse applies, dys-stress prevails. Participation in stressful activities is an individual thing and obviously individuals choose to become involved in such endeavors since they feel the goals they are seeking are worth the effort (Alderman, 1974). What may be stressful to some may be rewarding to others.

The concept of eustress -- dys-stress was first recognized by Jessie Bernard (1968) as a means of clarifying the term stress. Bernard proposed that stress, as researched to that time, need not necessarily have only negative connotations. The unpleasant, damaging and even painful kind of stress was referred to by Bernard as dys-stress,

while the pleasant kind of stress associated with excitement, thrilling experiences, fun, adventure and the release of energy was referred to as eustress. Eustress "turns people on" says Bernard, "and with it may lie the key to unlocking the motivational reservoir for social action" (Bernard, 1968). An individual will approach a stressful situation provided the outcome was perceived as being positive. The outcome would be interpreted by the individual in terms of fun, excitement, thrill and energy release as related to the attainment of the desired goal.

According to Dr. Sol Roy Rosenthal, a person must learn to control anxiety before he is able to experience these feelings of exhilaration and euphoria that result from situations involving risk, tension, stress and danger (Harris, 1973). Studies by Fenz and Epstein (1969) demonstrate the task of eustress seekers as attempting to regulate anxiety, not to eliminate it. They studied anxiety and its mastery among skydivers. Using a word association test scaled for relevance to skydiving, Fenz and Epstein located a source of stress in individuals. They also found that anxiety could serve a useful function by centering the attention of the individual on the task at hand. The study also supported other findings based on data which suggested that a little anxiety is useful, while too much

is harmful (Klavora, 1974; Wankel, 1969). Stiles (1967) found pronounced uniformity in the factors contributing to continued sports participation, the following being almost always present: the thrill and enjoyment of participation, a feeling of well being, and the challenge of difficult techniques and others. While investigating collegiate women's sport motives, Berlin (1974) found "the experience of stress" to be one of five personal derivative factors of motivation.

Limited research conducted to date suggests that while anxiety and fear remain with a person who is seeking eustress or when in stress-producing situations, the experienced participant learns to control rather than inhibit anxiety (Fenz and Epstein, 1969; Radloff and Helmreich, 1969; Lester, 1969; Erikson, 1969).

The concept of eustress -- dys-stress proposes that each individual in a sport situation seeks stress. The level of stress is specific to the individual and is a function of the individual's experience in the sport coupled with his ability to control anxiety. The nature of the stress sought is one of pleasantness. Experiences of limited duration are characteristic of eustressful activities. The stressors tend to be in a context that is the antithesis of routine, boredom, stability and sameness (Harris, 1974). Sport is a stressor, within its structure, psychic, social and physical stressors can be observed. Because of the

components, it is possible that sport fulfills the human need for an exciting stressful experience in a socially acceptable manner in societies that do not provide situations for fulfilling this need in other acceptable ways. Traditionally, physical activity and sports programs have been made as safe as possible for the participants due to the threat of legal liability suits against instructors and as a consequence, the danger and excitement has been minimized. Harris (1973) contends that, in a sense, this has led to a type of sensory deprivation for the participants and they have no choice but to look elsewhere for their stimulation. Since physical activity programs are not fulfilling this need, she suggests that perhaps sex, drugs, alcohol and crime are substitute activities to which individuals may turn in an attempt to satisfy this need. Harris (1970) further pointed out that the problem is not the suppression of this need but it is the channelling and providing of suitable alternatives for the expression of this need so that it does not eventuate in social destruction.

In supporting the theory of eustress seeking, Selye (1974) explains that "stress in the human organism is unavoidable" and that "freedom from stress is death". Trippet, in offering an explanation of "the ordeal of fun," suggests that the essence of entering life is disequilibrium; "to be, is to be in disequilibrium" (cited in Harris, 1974).

While Huberman (1969) and Harris (1970) suggest that stress-seeking is a universal human trait and it seems every individual has an instinctive need to pit himself against obstacles or forces to determine what type of individual he really is under this stress. The response to a challenge and the mastery of it appears to be a potential source of meaning for participation in many sporting events.

3. METHODS AND PROCEDURES

The sample consisted of 54 twelve year old boys and girls enrolled in the Woodwards' Learn to Ski Program held at Lake Eden Resort, Edmonton, Alberta. The original sample totalled 57 and was comprised of 29 girls and 28 boys. These subjects totalled all twelve year old boys and girls enrolled in the Learn to Ski Program. Therefore, it is assumed that the sample of 54 is a random representation of the hypothetical population of all twelve year old boys and girls enrolled in the Woodwards' Learn to Ski Program. The total sample was divided into six learning groups on the basis of skiing ability ranging from beginner to intermediate levels.

Prior to the first lesson for each group, the subjects, as a group, were taken inside the ski chalet and introduced to the study and the instruments to be used (Appendix A, B, C and D). Each subject was administered as a group, an A-Trait anxiety inventory then taken outside for the first lesson. A-Trait anxiety was measured a second time for each subject at the end of the program. The five lessons to follow began with each group meeting inside the chalet. All this time each subject was administered the Spielberger A-State anxiety inventory, then proceeded outside with the group for the lesson. On one occasion during each of the five lessons, the Eustress -- Dys-stress card was administered

to each subject (Appendix C) immediately prior to the execution of a new skill or activity. The 4 x 3 inch Eustress -- Dys-stress cards were carried by the invesigator. At the completion of each lesson the subject was asked to evaluate the lesson in terms of eustress -- dys-stress (Appendix D). The Evaluation of the Lesson questionnaire was printed on the reverse side of the Eustress -- Dys-stress questionnaire.[1]

The investigator, acting in the capacity of a ski instructor, was responsible throughout the Learn to Ski Program for minimizing dys-stress and maximizing eustress -- as he perceived it.

---

1. A stressful situation was contrived for lesson four wherein the investigator set up a modified downhill course for all subjects to complete. The subjects level of A-State anxiety was measured in order that the investigator could evaluate the level of A-State anixety operating in a specifically stressful situation for low and high trait anxiety groups. For these results turn to Appendix G.

Instruments

Spielberger's State - Trait Anxiety Inventory which was designed to provide a reliable, relatively brief self-report measure of A-State and A-Trait anxiety, was used (Appendix A and B). Item selection, scoring administration and validation for the inventory are described in detail in the State - Trait Anxiety Inventory Manual (Spielberger, 1970). In summary, the State - Trait Anxiety Inventory was designed to be self-administering and could be given either individually or to groups. The inventory has no time limits. It has been demonstrated that A-Trait scales are relatively impervious to the conditions under which they are given, while the A-State scale was designed to be a measure of the emotional state reflecting the conditions under which the test is administered (Johnson, 1968; Johnson and Spielberger, 1968; Lamb, 1969).

The range of possible scores varies from a minimum score of 20 to a maximum score of 80 on both the A-State and A-Trait subscales. Subjects respond to each item by rating themselves on a four point scale.. Most persons with fifth or sixth grade reading ability spontaneously respond to all of the STAI items without special instructions or prompting (Spielberger, 1970).

The test-retest reliability of the State - Trait Anxiety Inventory (A-Trait scale) is relatively high (.86).

The stability coefficients for the A-State scale, however, tend to be low as would be expected for a measure designed to be influenced by situational factors (Spielberger, 1970).

In the construction of the State-Trait Anxiety Inventory, individual items were required to meet prescribed A-Trait and A-State validity criteria at each stage of the test development process in order to be retained for further evaluation and validation (Spielberger, 1970).

Also used as a testing instrument was a Eustress - Dys-Stress Questionnaire (Appendix C). The five "feelings" are taken directly from Spielberger's A-State Inventory with the purpose of assessing the level of stress as pleasant (eustressful) or unpleasant (dys-stressful). In research in which repeated measurements of A-States are desired during performance, very brief scales consisting of as few as four or five STAI A-State items may be used to provide valid measures of A-State. Furthermore, responding to these brief A-State scales does not seem to interfere with performance (Spielberger, 1970).

The range of possible scores varies from a minimum score of 5 to a maximum score of 20 for both the Stress A and Unpleasant A subscales on the Eustress - Dys-stress inventory. A pilot study using 20 subjects revealed a .62 Pearson product-moment coefficient of correlation when correlating the Eustress - Dys-stress inventory with A-State.

The third inventory used -- self evaluation of the lesson (Appendix D) -- was aimed at assessing the individual's general state of stress throughout the lesson. It was hoped that the individual would, in effect, weigh up the total number of eustressful experiences in the lesson against the total number of dys-stressful experiences in order to provide an overall level of stress for the lesson as eustressful (pleasant) or dys-stressful (unpleasant). "Did you feel stressed during the lesson?" was labelled as Stress B for the statistical analysis. "Did you find this stress pleasant or unpleasant?" was labelled Unpleasant B.

4. RESULTS

Statistical analyses of the study employed the S.P.S.S. computor program (Statistical Package for the Social Sciences), except in the analyses of variance with repeated measures which were calculated by employing the DERS ANOVA 40 program.

Two girls withdrew from the original sample, To have equal n's when statistically analyzing the data, one boy was selected out through the method of random numbers leaving a final sample of 27 boys and 27 girls to be studied. The raw scores for all subjects and the Pearson product-moment coefficients of correlation for all variables are presented in Appendix F, respectively.

In the analyses, the terms group and lesson refer to the following:

1) Group - From the data of the preliminary testing session (i.e. Trait Anxiety), subjects were ranked in the manner indicated in Table 1 and assigned to a group which represented low, medium or high trait anxiety.

TABLE 1

Initial Trait Anxiety Scores of Each Subject **

Low Scores	20	21	22	23	24	25	26	27	28	29	30	TOTAL No. of Ss
Boys			1					3	1	3	1	9
Girls			1		2	2	1		1	2		9

Medium Scores	30	31	32	33	34	35	36	37	38	39	TOTAL
Boys				3		2	1	1	2		9
Girls	2	1		1	1			1	3		9

High Scores	39	40	41	42	43	44	45	46	47	48	51	
Boys		2			2		1	1	1	2		9
Girls	2		1	2	1		1		1		1	9
												54

** Possible Scores range from 20 - 80

A two way analysis of variance of each variable by sex and group found no significant difference between boys and girls for all variables. Given no significant difference for sex, subjects were grouped together in terms of low, medium and high levels of Trait anxiety (18 subjects per group) for all statistical analyses to follow.

2) Lesson - after the preliminary testing session, each subject was given five lessons, each one and one half hours in length. The lessons of relevance used in the statistical analyses are 1 and 5.

Consequently the variables analysed relating to each inventory are as follows:

1. Trait 1 and 2 was the level of A-Trait anxiety (Appendix A) measured prior to the first and last session of the program.
2. State 1 and 5 was the level of A-State anxiety (Appendix B) measured immediately prior to lesson one and five.
3. Stress A 1 and 5 was the level of stress measured by the Eustress -- Dys-stress questionnaire (Appendix C) administered prior to a stressful situation in lessons 1 and 5.
4. Unpleasant - A 1 and 5 was the feeling associated with Stress A. The feeling is interpreted as pleasant or unpleasant (Appendix C).
5. Stress B 1 and 5 was the level of stress measured by the Self Evaluation of the Lesson questionnaire

(Appendix D) administered at the completion of lessons 1 and 5.

6. Unpleasant B 1 and 5 was a response to the feelings associated with Stress B (Appendix D). The stress is interpreted as either pleasant or unpleasant.

The tables and figures, as presented, illustrate all changes in the levels of stress and the significance of these changes as affecting groups and as an effect of lessons. Unless otherwise stated, 0.05 has been used as the level of significance for any significant differences.

The results are presented with respect to the stated hypotheses.

Ho_1: The level of stress experienced by an individual prior to participation in a Learn to Ski Program is the same at the beginning as at the completion of the program.

Table 2 and Figure 1 illustrate the mean State anxiety scores for each group over four lessons.

TABLE 2

Summary of the Mean Scores for Each Group's State Anxiety Lessons One and Five

	LESSON	LESSON
GROUPS:	1	5
LOW	33.72	27.78
MEDIUM	34.78	30.28
HIGH	46.67	35.72

FIGURE 1

State Anxiety

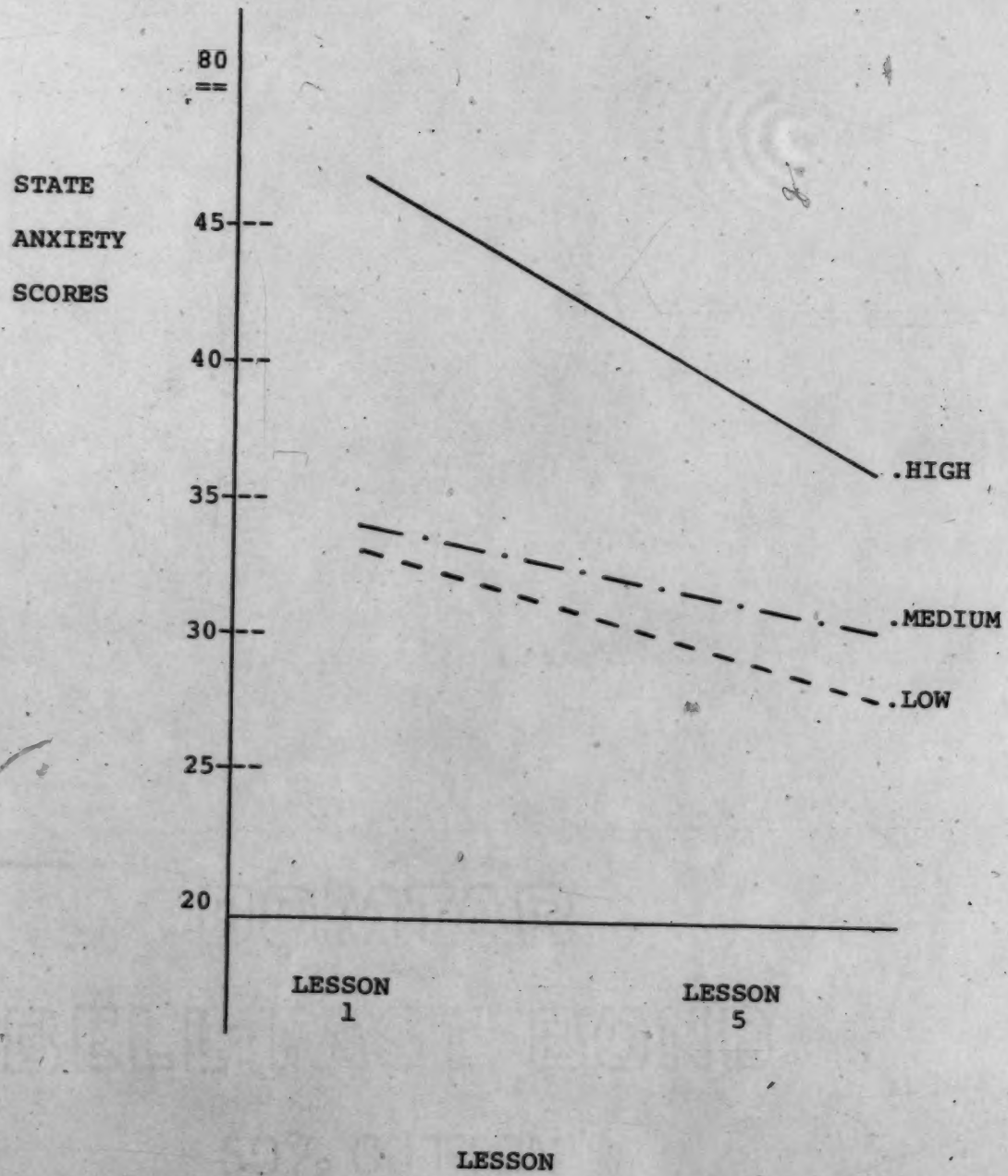

Table 3 summarizes the analysis of variance for State anxiety measured between groups over the two lessons. Significant F's were obtained for group and lesson effects.

TABLE 3

2-Way Analysis of Variance for State Anxiety

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
TOTAL	10319.66	107	96.45	
BETWEEN	7425.16	53	140.09	
A (group)	2248.29	2	1124.15	11.08 ***
ERROR	5176.86	51	101.51	
WITHIN	2894.50	54	53.60	
D (LESSONS)	1372.45	1	1372.45	53.18 ***
AD	205.85	2	102.93	3.
ERROR	1316.19	51	25.81	.99

F's of 3.18 (D.F. of 2,51) and 4.03 (D.F. of 1,51) were required for significance at the .05 level.

***Significant at the .001 level

A Scheffé test (Scheffé, 1953)[2] for multiple comparisons of State anxiety with groups showed a significant difference between low and high, and between medium and high groups (Table 4). There was no significant difference between low and medium groups of trait anxiety.

TABLE 4

Scheffé Test for Group Means for State Anxiety

Group 1	Group 2	Group 3	Mean Difference
30.75	32.53		1.78
30.75		42.19	11.44 *
	32.53	42.19	9.66 *

A mean difference of 5.71 was required for significance at the .05 level.

*Significant at the .05 level.

The F-ratio for lesson effect shows a significant difference in State anxiety when comparing the first and last lesson of the learn-to-ski program. Since there are only two lesson means a difference of means test is not necessary.

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2. Scheffé's test was used for two reasons:
   1) It employs an experimental error rate; i.e. the probability of a type 1 error is at most 2 for the entire set of comparisons.
   2) It allows for all comparisons of means.

The results indicate the level of stress experienced by an individual prior to participation in a Learn-to-ski Program is significantly different at the completion of the program as at the beginning.

Ho_2: All stress experienced in a Learn to Ski Program is dys-stress.

Table 6 and Figure 2 graphically illustrate the change in "pleasantness" associated with the stress measured during the two lessons. Unpleasant A is the feeling associated with the five responses taken directly from Spielberger's A-State anxiety inventory (Appendix C, page 68).

TABLE 5

Summary of the Mean Unpleasant A Scores for Each Group in Lessons One and Five

GROUP	LESSON 1	LESSON 5
LOW	11.05	6.16
MEDIUM	12.56	7.39
HIGH	14.67	8.94

Figure 2

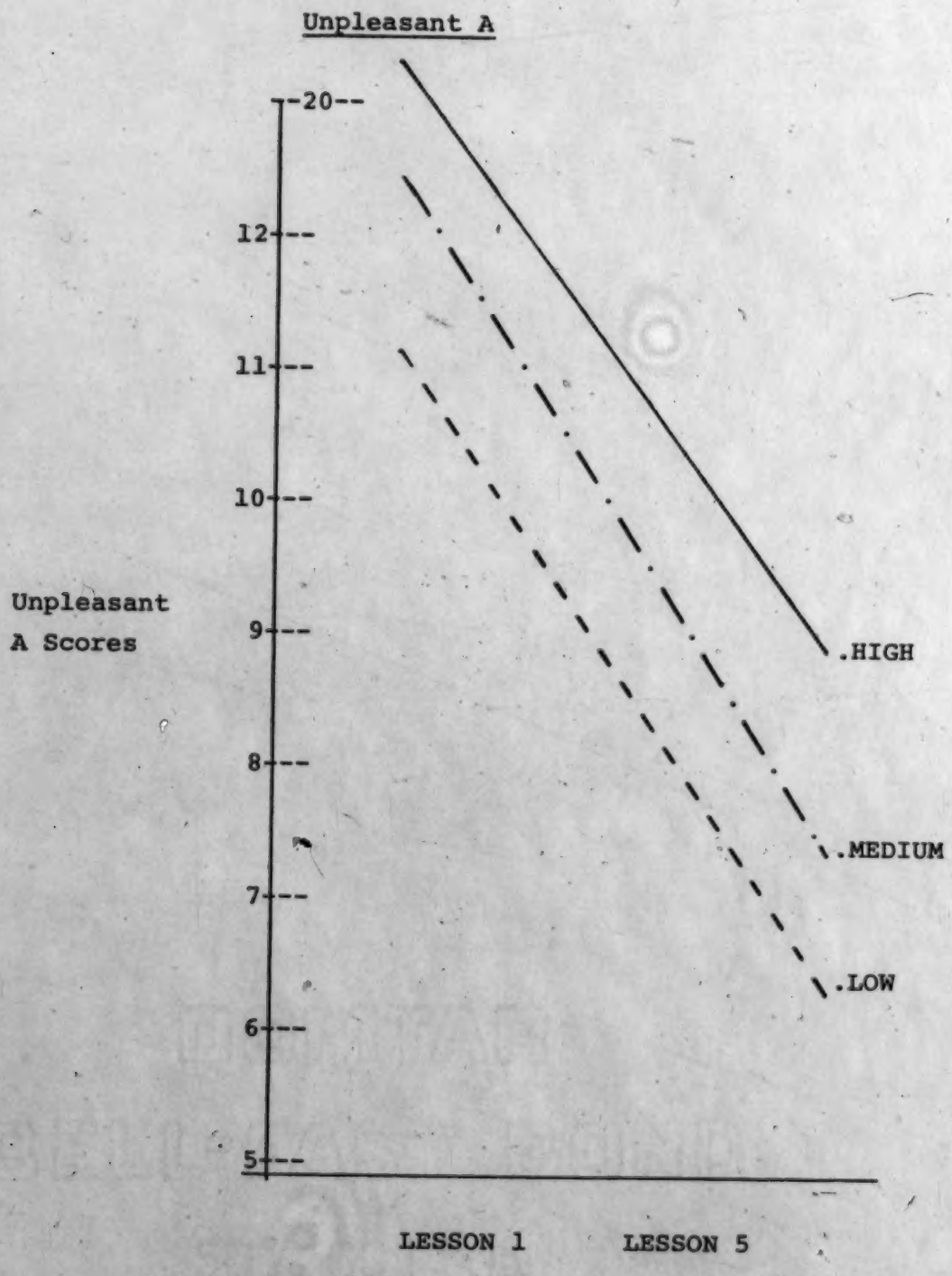
Unpleasant A
20
12
11
10
Unpleasant
A Scores
9
8
7
6
5
.HIGH
.MEDIUM
.LOW
LESSON 1
LESSON 5

Table 6 summarizes the analysis of variance for Unpleasant A measured between groups and over the two lessons. Significant F's were obtained for both groups and lesson effect.

TABLE 6

2-Way Analysis of Variance for Unpleasant A

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
TOTAL	2158.19	107	20.17	
BETWEEN	891.19	53	16.82	
A (GROUP)	185.19	2	92.51	6.68 **
ERROR	706.17	51	13.85	
WITHIN	1267.00	54	23.46	
D (LESSONS)	746.82	1	746.82	43.68 ***
AD	3.24	2	1.62	
ERROR	516.94	51	10.14	0.16

F's of 3.18 (D.F. of 2,51) and 4.03 (D.F. of 1,51) were required for significance at the .05 level.

** Significant at the .01 level.

*** Significant at the .001 level.

A Scheffé test (Table 7) for Unpleasant A on groups revealed a significant difference between low and high groups of trait anxiety.

TABLE 7

Scheffé Test for Group Means for Unpleasant A

GROUP 1	GROUP 2	GROUP 3	MEAN DIFFERENCE
8.61	9.97		1.36
8.61		11.80	3.19*
	9.97	11.80	1.83

A mean difference of 2.10 was required for significance at the .05 level.

*Significant at the .05 level.

The F ratio for lesson effect shows a significant difference in Unpleasant A when comparing the first and last lesson of the Learn-to-Ski program.

The results of the Unpleasant A variable indicate that stress experienced in a Learn-to-Ski program is not all dys-stress.

Ho_3: State and Trait anxiety are correlated for each individual regardless of the stress in the situation.

Pearson product-moment coefficients of correlation (Table 8) obtained for Trait and State anxiety were highly significant.

TABLE 8

Summary of the Pearson Correlation Coefficients of Trait with State

	State 1	State 5
Trait 1	0.64 s = .001	0.40 s = .001
Trait 2	0.67 s = .001	0.54 s = .001

Although the results in Table 8 indicate a reduction in the correlation between State and Trait anxiety over the six week period, the reduction is not significant. These correlations are somewhat higher than predicted correlations which were .30 to .47 (Spielberger, 1970) and the findings of Hodges (1967), Hodges and Spielberger (1966) and Lamb (1969).

Ho_4: An individual's level of Trait anxiety will be the same at the completion of a Learn to Ski Program as it was at the beginning of the program.

Summary of the means for Trait anxiety for each group between week 1 and 2 are illustrated in Table 9 and Figure 3. A significant t value was calculated for the difference in mean Trait scores for week 1 and week 2 (Table 10).

TABLE 9

Summary of the Mean Trait Anxiety Scores for Each Group over the Six Week Period

GROUPS	WEEK 1	WEEK 6
LOW	26.67	26.05
MEDIUM	34.83	31.33
HIGH	43.83	41.72
OVERALL MEAN	35.11	33.04

Figure 3

Trait Anxiety

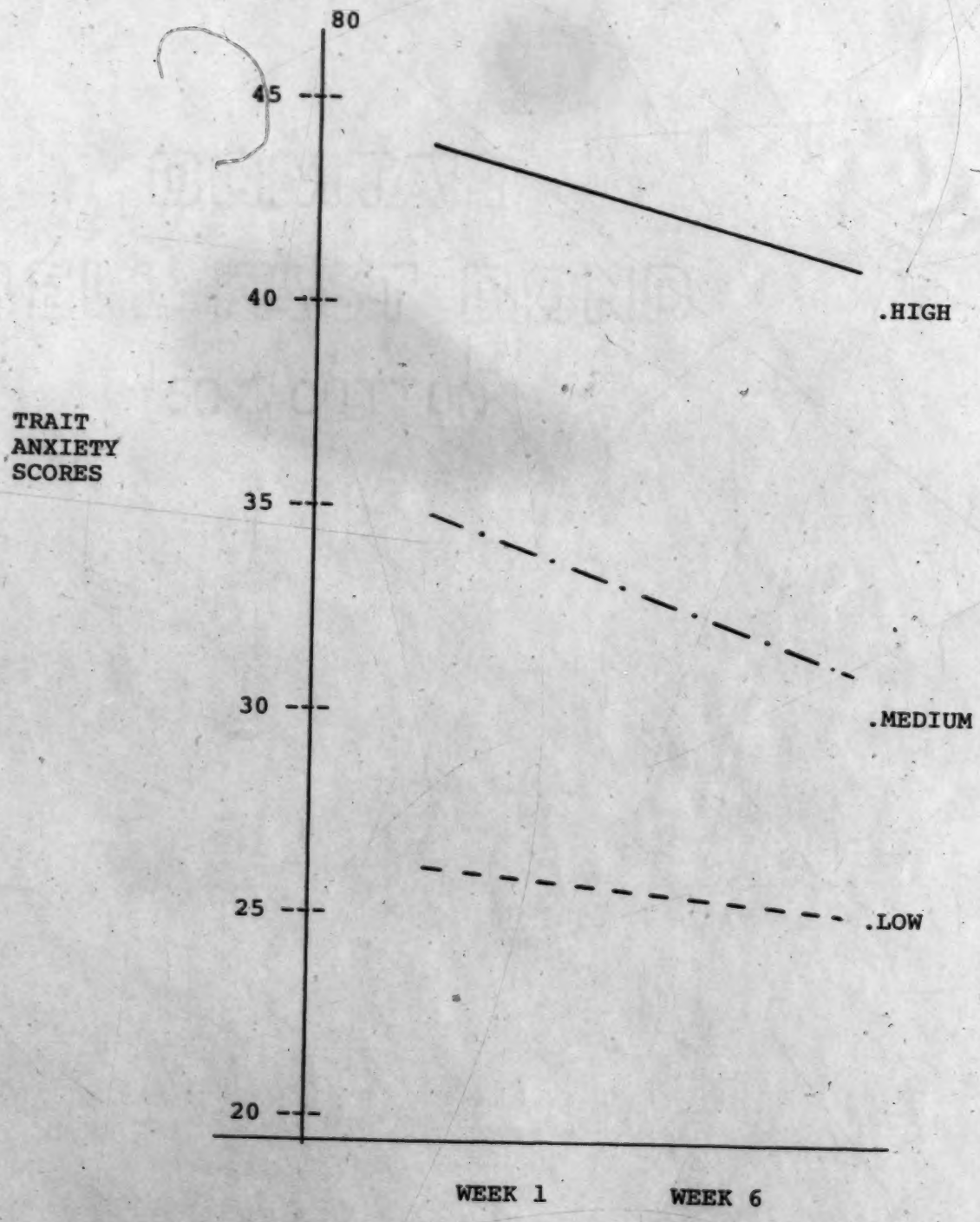

TABLE 10

Results of t-test Analysis on A-Trait and A-Trait 2

VARIABLE	NUMBER OF CASES	MEAN	STANDARD ERROR	DEGREES OF FREEDOM	T VALUE
A-Trait	54	35.11	1.04	53	3.55 ***
A-Trait 2		33.04	1.11		

*** Significant at the .001 level.

Although these results conflict with the findings of Lamb (1969) and the State-Trait theory of Spielberger (1970) the investigator believes the significant difference found in Trait 1 and Trait 2 is due primarily to the medium trait anxiety group fluctuating from a mean in session 1 of 34.83 to a mean of 31.33 in the final session. The difference in means for the low and high trait anxiety groups appear negligible. The possibility exists that the subjects' response to the A-Trait anxiety inventory was a reflection of the learn-to-ski situation. That in fact subjects revealed a level of A-State anxiety rather than A-Trait anxiety. This is quite feasible when comparing the similarity of the A-Trait and A-State anxiety inventories.

Ho_5: The level of stress experienced in specific situations during a Learn to Ski Program is the same in the first and last lessons.

Table 11 and Figure 4 illustrate the mean Stress A scores for each group in Lessons one and five. Stress A is the response given to the five questions taken directly from Spielberger's A-State Inventory (Appendix C). Stress A, which was administered immediately prior to a stressful situation, could be considered a more specifically situational stressful measure.

TABLE 11

Summary of the Mean Stress A Scores for Each Group Lessons One and Five

GROUP	LESSON 1	LESSON 5
LOW	9.16	5.89
MEDIUM	9.38	7.83
HIGH	12.39	8.50

Figure 4

Stress A

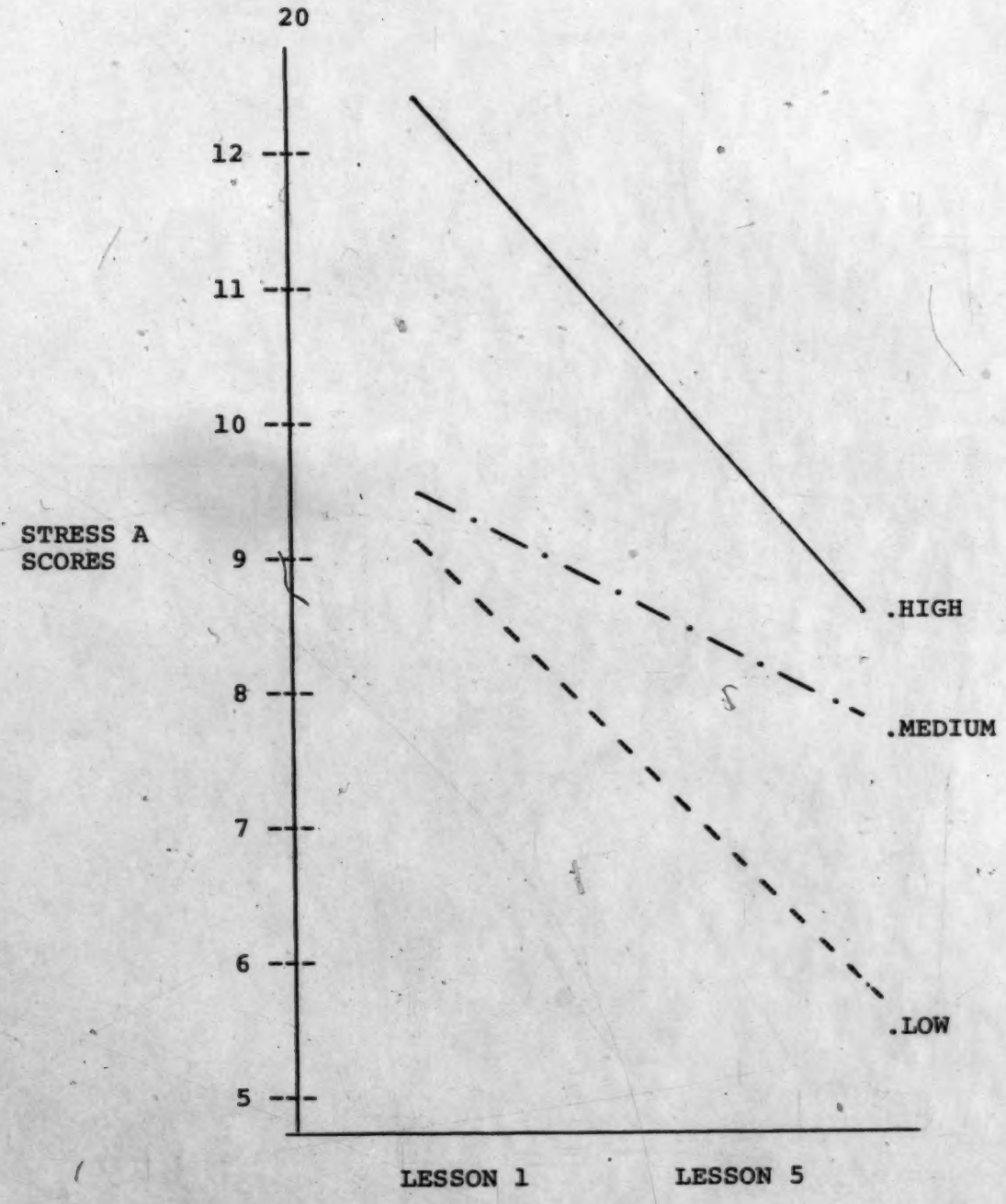

Table 12 summarizes the analysis of variance for Stress A measured between groups and over lessons. Significant F's were obtained for groups and lesson effects.

TABLE 12

2-Way Analysis of Variance for Stress A

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
TOTAL	1278.92	107	11.95	
BETWEEN	697.42	53	13.16	
A (GROUP)	156.50	2	78.25	7.38 ***
ERROR	540.92	51	10.61	
WITHIN	581.50	54	10.77	
D (LESSONS)	228.23	1	228.23	35.61 ***
AD	26.35	2	13.17	2.05
ERROR	326.91	51	6.41	

F's pf 3.18 (D.F. of 2,51) and 4.03 (D.F. of 1,51) were required for significance at the .05 level.

*** Significant at the .001 level.

A Scheffé test (Table 13) for Stress A on groups revealed a significant difference between low and high and medium and high groups.

TABLE 13

Scheffé Test for Group Means for Stress A

GROUP 1	GROUP 2	GROUP 3	MEAN DIFFERENCE
7.53	8.61		1.08
8.01		10.44	2.91 *
	8.61	10.44	1.83 *

A mean difference of 1.65 was required for significance at the .05 level.

*Significant at the .05 level.

The F ratio for lesson effect revealed a significant difference in Stress A when comparing lessons one and five. Analysis of the variable Stress A indicates that the level of stress experienced in specific situations during a Learn to Ski Program is lower in the final lesson as compared to the level of stress experienced in the first lesson.

Related Results

Table 14 and Figure 5 illustrate the mean Stress B scores over the two lessons for each group. Stress B is the response to: "Did you feel stressed during the lesson?" (Self evaluation of the lesson inventory - Appendix D).

TABLE 14

Summary of the Mean Stress B Scores for Each Group Lessons One and Five

GROUP	LESSON 1	LESSON 5
LOW	1.56	1.00
MEDIUM	1.50	1.06
HIGH	1.78	1.17

Figure 5

Stress B

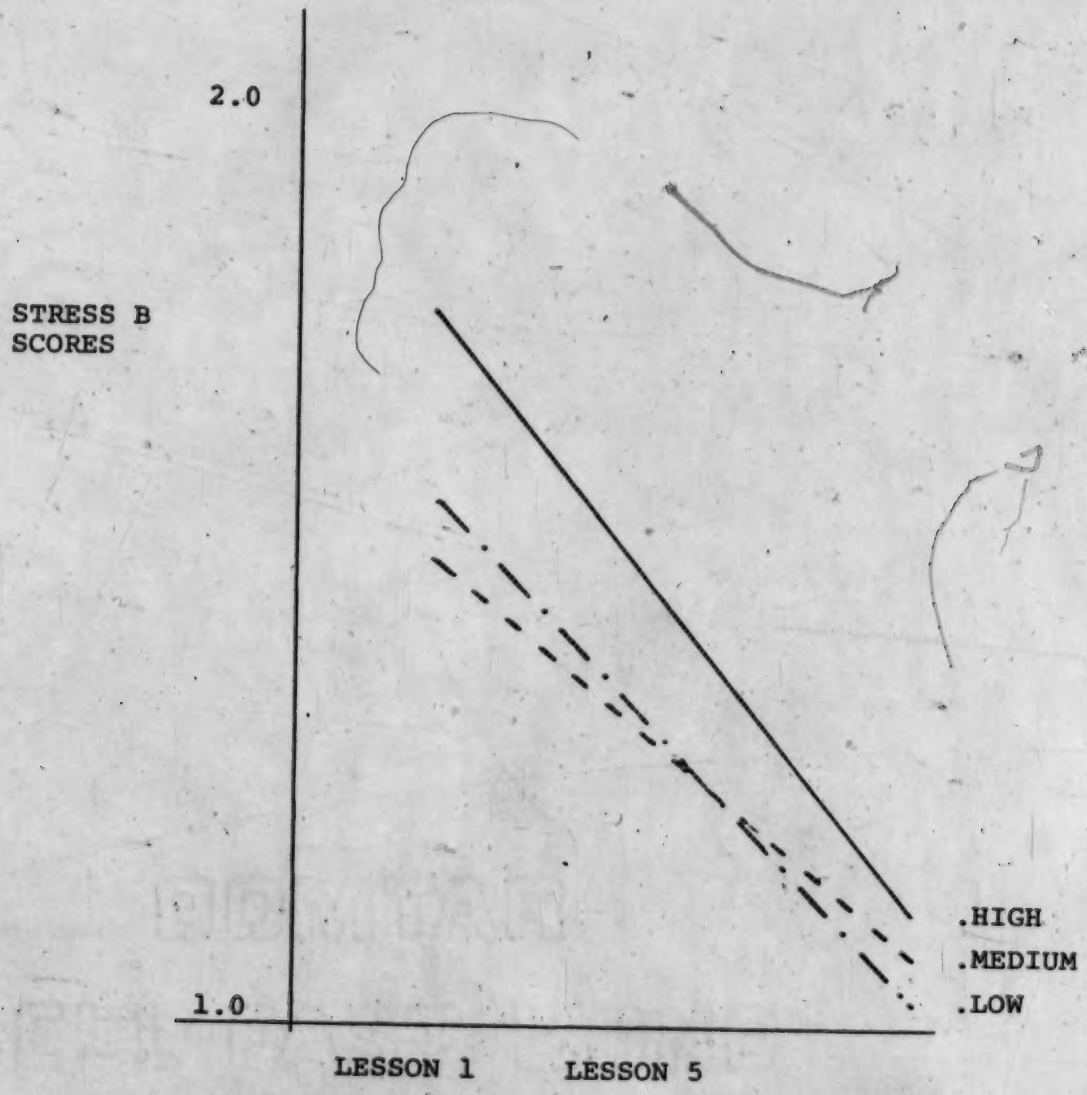

Table 15 summarizes the analyses of variance for group and lesson effect on Stress B. Significant F's were obtained for both groups and lessons.

TABLE 15

2-Way Analysis of Variance for Stress B

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Total	24.32	107	0.23	
Between	9.82	53	0.19	
A (Group)	1.12	2	0.56	3.20 *
Error	8.92	51	0.17	
Within	14.50	54	0.27	
D (lessons)	7.79	1	7.79	60.32 ***
AD	0.13	2	0.06	0.50
Error	6.58	51	0.13	

F's of 3.18 (D.F. of 2,51) and 4.03 (D.F. of 1,51) were required for significance at the .05 level.

* Significance at the .05 level.

*** Significance at the .001 level.

A Scheffé test (Table 16) indicates a significant difference between low and high, and medium and high groups.

TABLE 16

Scheffé Test for Mean Stress B Scores for Groups

GROUP 1	GROUP 2	GROUP 3	MEAN DIFFERENCE
1.72	1.72		.00
1.72		1.52	.20 *
	1.72	1.52	.20 *

A mean difference of .19 was required for significance at the .05 level.

* Significant at the .05 level.

The F ratio for lesson effect revealed a significant difference in Stress B when comparing the first and last lesson of the Learn to Ski Program.

Results from the analysis of variable Stress B indicate that the level of stress experienced by subjects during each lesson decreased from lesson one to lesson five.

Table 17 and Figure 6 illustrate the mean Unpleasant B scores for groups over four lessons. Unpleasant B is the response to: "Did you find this stress pleasant or unpleasant?" (Self evaluation of the lesson inventory - Appendix D).

TABLE 17

Summary of the Means for Unpleasant B for Each Group Lessons One and Five

GROUP	LESSON 1	LESSON 5
LOW	1.56	1.00
MEDIUM	1.39	1.06
HIGH	1.67	1.16

Figure 6

Unpleasant B

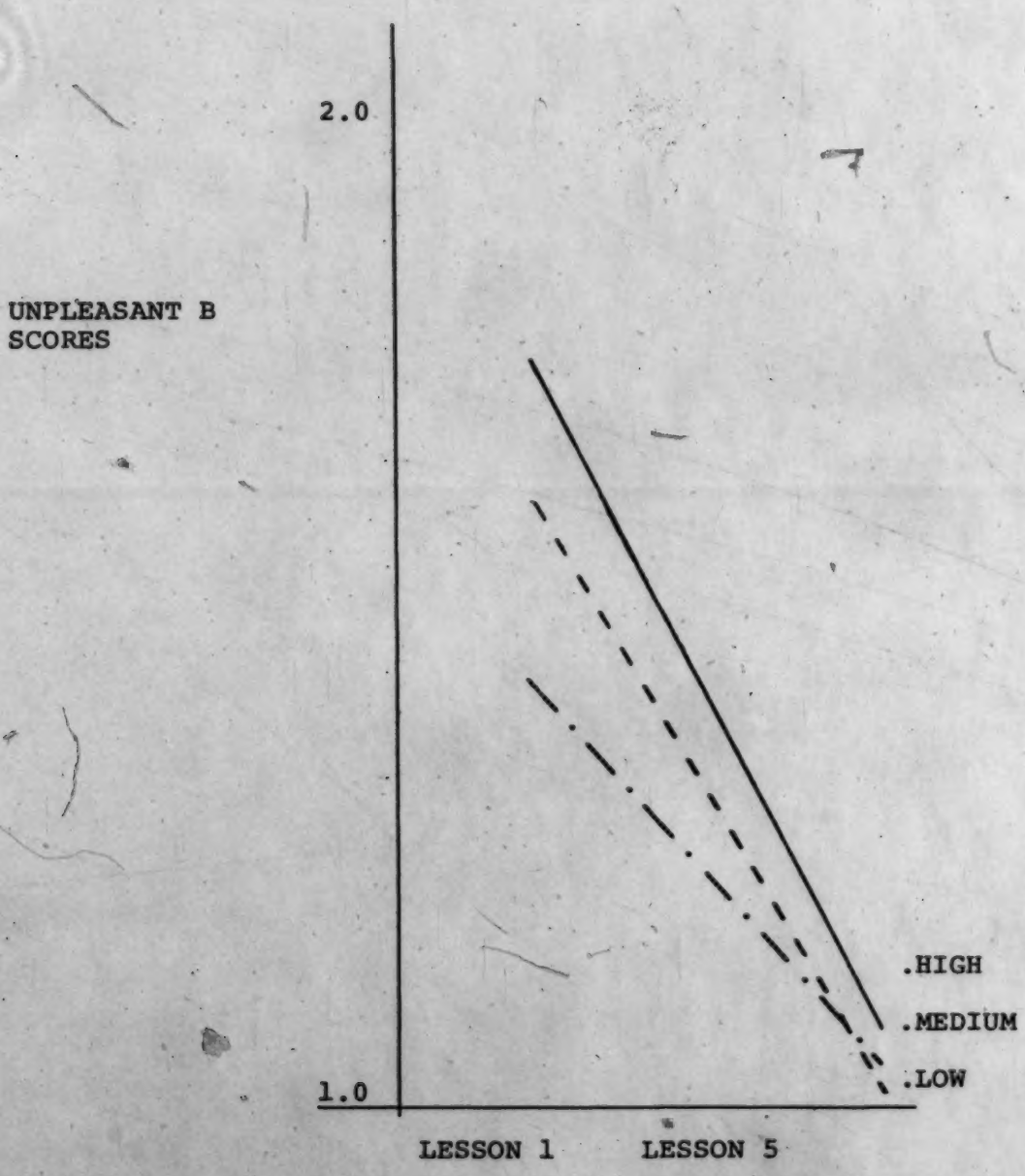

Table 18 summarizes the analysis of variance for group and lesson effects for Unpleasant B. A significant F was obtained for lesson effect.

TABLE 18

2-Way Analysis of Variance for Unpleasant B

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Total	22.92	107	0.21	
Between	10.42	53	0.19	
A (Group)	0.72	2	0.36	1.89
Error	9.69	51	0.19	
Within	12.50	54	0.23	
D (Lesson)	5.79	1	5.79	45.60 ***
AD	0.24	2	0.12	0.9
Error	6.47	51	0.13	.05

F's of 3.18 (D.F. of 2,51) and 4.03 (D.F. of 1,51) were required for significance at the .05 level.

*** Significance at the .001 level.

The variable Unpleasant B was a measure of pleasantness or unpleasantness associated with the stress experienced during each lesson. The level of unpleasantness decreased from lesson one to lesson five.

5. DISCUSSION

The purpose of this study was to investigate the effects of a Learn to Ski Program on an individual's level of stress. The level of stress was measured on a sample of 54 twelve year old boys and girls using four instruments. Due to the fact that no significant difference was found between male and female scores, all subjects were allocated to one of three groups (low, medium, high) based on the individual's initial A-Trait anxiety score. Statistical analyses were calculated on each group over a four lesson period.

Experience in the Learn to Ski Program had a significant effect on reducing an individual's level of stress when measured at four different stages using four different inventories. Trait anxiety, which was measured prior to the first and final sessions of the program decreased significantly over the six week period. This contradicts the State-Trait theory proposed by Spielberger (1966, 1970) and the findings of Lamb (1969). Lamb found that in contrast to large changes in the State-Trait Anxiety Inventory A-State scores, A-Trait scores remained stable and unaffected by the experimentally induced stress. If in effect, as indicated by this study, an individual's general level of anxiety can be reduced by experiences in stressful situa-

tions, an individual's ability to cope with anxiety would improve as a result of experiences in stress-reducing situations. The relevance being that A-Trait anxiety is a general level of anxiety not specific to any situation. If the general level of anxiety is reduced in a learn to ski program, it would, be Spielberger's definition, be reduced in other anxiety provoking situations. The investigator feels however, that the significant difference in A-Trait anxiety over the six week program is a function of a number of possibilities. The A-Trait inventory was administered in the ski chalet at the beginning and at the completion of the program where in effect the subjects quite possibly responded to that situation. As a function of the learn to ski program the initial and final measures of A-Trait anxiety are significantly different. Also the A-Trait and A-State inventories are both measures of anxiety using very similar statements.

Experience in the ski program had a significant effect on an individual's State anxiety which was measured immediately before each lesson began. Results from the A-State anxiety inventory were consistent with the State-Trait Anxiety Inventory theory which states that high A-Trait subjects have significantly higher A-State scores than low A-Trait subjects (Spielberger, 1966; O'Neil, Hanson and Spielberger, 1969; Klavora, 1974; and O'Neil, 1969).

However, the correlation found between A-Trait and A-State contrasts with O'Neil (1969) who found no significant correlation between A-Trait and A-State, and Spielberger who found less significant correlations. Spielberger (1970) suggests larger correlations are obtained between the scales under conditions which pose some threat to self-esteem, than when obtained in situations characterized by physical dangers. The investigator believes the correlations found between A-Trait and A-State are due to both questionnaires being measures of anxiety, one not significantly unlike the other. In addition, the A-State inventory was administered before the lesson where the imminency of the stressful situation was not felt. This is evident when comparing A-State with Stress A scores, Stress A being the response to five statements taken directly from the A-State inventory, but which is obtained in a more intensely stressful situation. Stress A also revealed significant reductions in the individual's level of a stress as a result of experience in the ski program.

There was a significant difference in the individual's level of stress when measured at the completion of each lesson (Stress B). The Unpleasant A aspect of the Eustress-Dys-stress questionnaire showed a significant difference in the level of pleasantness felt immediately prior to a stressful situation during a lesson. Unpleasant A is the

response to the feelings associated with the five statements of the Eustress-Dys-stress Questionnaire (Appendix D). Similarly the Unpleasant B response of the Self Evaluation of the Lesson inventory (Appendix D) showed a significant difference in the level of pleasantness felt throughout the lesson. Both Unpleasant A and Unpleasant B indicate as the level of stress decreased the associated feelings became more pleasant.

These findings indicate that the level of stress experienced by individuals in a learn to ski program can be reduced and the feelings associated with the stress made more pleasant.

6. SUMMARY AND CONCLUSION

The following conclusions are made with regard to the hypotheses under test.

1). The level of stress experienced by an individual prior to participation in a learn to ski program is greater at the beginning than at the completion of the program.

2). All stress experienced in a learn to ski program is dys-stress.

3). An individual's level of state and trait anxiety are correlated regardless of the stress in the situation.

4). An individual's level of trait anxiety is significantly lower at the completion of a learn to ski program than it was at the beginning of the program.

5). The level of stress experienced in specific situations during a learn to ski program is significantly higher in the first lesson than the last.

The Eustress-Dys-stress theory that stress is a motivator for participation in sport was not directly supported. Indirectly though, the investigator feels the study did support the theory. Individuals do appear to seek a level of stress which provides them with excitement, interest, enjoyment and the release of energy. The investigator believes that when individuals attained the state which they responded to as pleasant they did not interpret the

the state as eustressful, that in fact the subjects interpreted stress in the terms most commonly referred to as unpleasant or in this study dys-stress. To investigate fully the eustress-dys-stress theory, it would be necessary to develop an instrument much more specific than the ones used in this study.

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Measurement of Trait Anxiety

APPENDIX A

HOW DO YOU GENERALLY FEEL

NAME _____ SPORT _____ DATE _____

DIRECTIONS: There are no right or wrong answers. Mark the answer which seems to describe your general feelings best.

		ALMOST NEVER	SOME-TIMES	OFTEN	ALMOST ALWAYS
1.	I feel pleasant	(1)	(2)	(3)	(4)
2.	I tire quickly	(1)	(2)	(3)	(4)
3.	I feel like crying .	(1)	(2)	(3)	(4)
4.	I wish I could be as happy as others seem to be	(1)	(2)	(3)	(4)
5.	I am losing out on things because I can't make up my mind soon enough	(1)	(2)	(3)	(4)
6.	I feel rested	(1)	(2)	(3)	(4)
7.	I am "calm, cool and collected"	(1)	(2)	(3)	(4)
8.	I feel that difficulties are piling up so that I cannot overcome them	(1)	(2)	(3)	(4)
9.	I worry too much over something that really doesn't matter	(1)	(2)	(3)	(4)
10.	I am happy	(1)	(2)	(3)	(4)

APPENDIX A (CONTINUED)	ALMOST NEVER	SOME-TIMES	OFTEN	ALMOST ALWAYS
11. I am inclined to take things hard	(1)	(2)	(3)	(4)
12. I lack self-confidence	(1)	(2)	(3)	(4)
13. I feel secure	(1)	(2)	(3)	(4)
14. I try to avoid facing a crisis or difficulty	(1)	(2)	(3)	(4)
15. I feel blue	(1)	(2)	(3)	(4)
16. I am content	(1)	(2)	(3)	(4)
17. Some unimportant thought runs through my mind and bothers me	(1)	(2)	(3)	(4)
18. I take disappointments so keenly that I can't put them out of my mind	(1)	(2)	(3)	(4)
19. I am a steady person	(1)	(2)	(3)	(4)
20. I get in a state of tension or turmoil as I think over my recent concerns and interests	(1)	(2)	(3)	(4)

Measurement of State Anxiety

APPENDIX B

HOW DO YOU FEEL RIGHT NOW

NAME _____ SPORT _____ DATE _____

	NOT AT ALL	SOME-WHAT	MODER-ATELY SO	VERY MUCH SO
1.I feel calm	(1)	(2)	(3)	(4)
2.I feel secure	(1)	(2)	(3)	(4)
3.I am tense	(1)	(2)	(3)	(4)
4.I am regretful ...	(1)	(2)	(3)	(4)
5.I feel at ease ...	(1)	(2)	(3)	(4)
6.I feel upset	(1)	(2)	(3)	(4)
7.I am presently worrying over possible misfortunes	(1)	(2)	(3)	(4)
8.I feel rested	(1)	(2)	(3)	(4)
9.I feel anxious ...	(1)	(2)	(3)	(4)
10.I feel comfortable	(1)	(2)	(3)	(4)
11.I feel self-confident	(1)	(2)	(3)	(4)
12.I feel nervous ...	(1)	(2)	(3)	(4)
13.I am jittery	(1)	(2)	(3)	(4)
14.I feel "high strung"	(1)	(2)	(3)	(4)
15.I am relaxed	(1)	(2)	(3)	(4)
16.I feel content ...	(1)	(2)	(3)	(4)
17.I am worried	(1)	(2)	(3)	(4)

APPENDIX B (CONTINUED)

	NOT AT ALL	SOME-WHAT	MODER-ATELY SO	VERY MUCH SO
18. I feel over-excited and "rattled".	(1)	(2)	(3)	(4)
19. I feel joyful	(1)	(2)	(3)	(4)
20. I feel pleasant ..	(1)	(2)	(3)	(4)

APPENDIX C

EUSTRESS DYS-STRESS QUESTIONNAIRE

NAME _____ DATE _____

SITUATION	THIS FEELING IS								
	Not at all----------	Somewhat----------	Moderately so----------	Very much so----------	Pleasant----------	Moderately pleasant----------	Somewhat pleasant----------	Not at all pleasant----------
1. I am tense.....	1	2	3	4	1	2	3	4
2. I am worrying over possible misfortunes.....	1	2	3	4	1	2	3	4
3. I am jittery.....	1	2	3	4	1	2	3	4
4. I feel over excited.....	1	2	3	4	1	2	3	4
5. I feel nervous	1	2	3	4	1	2	3	4

APPENDIX D

Self Evaluation of the Lesson

NAME _____ DATE _____

SITUATION	THIS FEELING IS EITHER	
	YES	NO
1. Did you feel stressed during the lesson?	(1)	(2)
2. Did you find this stress[3] pleasant or unpleasant?	(1)	(2)

---

[3] For the purposes of further study using this instrument it is suggested that Unpleasant B should be structured as follows:

	YES	
Did you find this stress pleasant?	(1)	CIRCLE ONE
Did you find this stress unpleasant?	(1)	

APPENDIX E

RAW SCORES OF SUBJECTS ON EACH VARIABLE

KEY TO THE FOLLOWING TABLE:

StA = Stress A

UNPA = Unpleasant A

UNPB = Unpleasant B

StrB - Stress B

2 = Yes

1 = No

2 = Unpleasant

1 = Pleasant

APPENDIX E

RAW SCORES OF SUBJECTS ON EACH VARIABLE

I.D. NO.	SEX	TRAIT 1	TRAIT 2	STATE 1	STATE 2	STATE 3	STATE 4	STATE 5	StA 1	UNPA 1	StrB 1	UNPB 1	StA 2	UNPA 2	StrB 2	UNPB 2	StA 3	UNPA 3	StrB 3	UNPB 3	StA 4	UNPA 4	StrB 4	UNPB 4	StA 5	UNPA 5	StrB 5	UNPB 5
11	F	22	20	37	29	27	27	22	10	9	2/2		6	7	1/1		5	6	1/1		5	5	1/1		5	5	1/1	
12	F	24	23	29	25	22	20	24	6	5	1/1		10	13	1/1		7	8	1/1		8	8	1/1		6	6	1/1	
13	F	24	24	24	31	30	32	30	5	5	1/1		5	5	1/1		5	6	1/1		6	7	1/1		6	6	1/1	
14	F	25	29	37	44	42	40	37	16	20	2/2		16	18	2/2		10	8	1/1		6	6	1/1		5	5	1/1	
15	F	25	25	23	30	27	32	22	14	18	2/2		10	15	1/1		7	6	1/1		7	5	1/1		7	5	1/1	
16	F	26	33	53	49	49	47	43	7	8	2/2		9	13	1/1		7	7	1/1		7	10	1/1		5	5	1/1	
17	F	28	26	34	28	28	28	27	12	16	2/2		10	11	1/1		5	5	1/1		7	5	1/1		5	5	1/1	
18	F	29	27	37	35	34	35	31	6	8	1/1		8	9	1/1		7	7	1/1		6	6	1/1		6	5	1/1	
19	F	29	29	31	29	27	28	22	6	8	1/1		5	5	1/1		5	5	1/1		5	5	1/1		5	5	1/1	
21	F	30	28	36	36	31	24	20	5	5	1/1		5	5	1/1		5	5	1/1		5	5	1/1		7	7	1/1	
22	F	30	28	31	32	28	40	35	7	8	1/1		8	10	1/1		9	9	1/1		8	9	1/1		11	12	1/1	
23	F	31	23	22	23	21	26	22	6	7	1/1		12	12	1/1		9	9	1/1		11	9	1/1		12	11	1/1	
24	F	33	26	32	39	36	40	26	10	15	2/2		10	13	2/2		8	7	1/1		7	6	1/1		7	6	1/1	
25	F	34	32	35	36	30	34	28	13	16	2/2		9	10	1/1		7	6	1/1		8	9	1/1		6	6	1/1	
26	F	37	37	34	26	21	33	26	10	15	1/1		11	14	1/1		8	8	1/1		9	8	1/1		10	10	1/1	
27	F	38	32	43	00	44	59	48	16	15	2/2		14	12	2/2		10	9	1/1		14	17	2/2		6	7	1/1	
28	F	38	34	30	39	34	36	30	7	6	2/2		14	15	1/1		7	6	1/1		5	5	1/1		5	5	1/1	
29	F	38	38	52	47	42	47	40	16	18	2/2		11	8	2/2		7	11	2/2		12	15	2/2		10	8	2/2	

APPENDIX E (CONTINUED)

I.D. NO.	SEX	TRAIT 1	TRAIT 2	STATE 1	STATE 2	STATE 3	STATE 4	STATE 5	StA 1	UNPA 1	StrB 1	UNPB 1	StA 2	UNPA 2	StrB 2	UNPB 2	StA 3	UNPA 3	StrB 3	UNPB 3	StA 4	UNPA 4	StrB 4	UNPB 4	StA 5	UNPA 5	StrB 5	UNPB 5
31	F	39	36	52	00	44	46	43	17	20	2	2	14	17	2	2	11	13	2	2	9	17	2	2	11	12	2	2
32	F	39	40	34	35	34	36	37	11	15	2	2	5	10	1	1	5	6	1	1	5	5	1	1	5	6	1	1
33	F	41	44	47	39	37	46	46	16	16	1	1	13	15	2	2	8	9	1	1	11	10	1	1	10	10	1	1
34	F	42	32	43	40	37	41	31	7	11	2	2	7	9	1	1	7	6	1	1	7	8	1	1	6	6	1	1
35	F	42	44	50	48	46	51	42	14	17	2	2	14	17	2	2	14	15	2	2	15	17	2	2	12	14	2	2
36	F	43	41	46	37	44	56	34	12	16	2	2	7	11	1	1	6	8	1	1	15	17	2	2	9	10	1	1
37	F	45	37	62	42	35	38	37	17	18	2	2	9	11	2	2	7	5	1	1	8	9	1	1	9	11	1	1
38	F	47	49	36	37	29	29	25	17	20	2	2	14	15	2	2	8	9	1	1	6	6	1	1	8	8	1	1
39	F	51	46	61	50	48	51	44	15	18	2	2	15	17	2	2	9	8	1	1	9	8	1	1	9	8	1	1
51	M	22	24	26	32	28	25	23	8	17	1	1	12	16	2	2	10	12	1	1	7	12	1	1	7	7	1	1
52	M	27	24	31	27	25	25	24	7	7	1	1	10	11	1	1	8	7	1	1	7	7	1	1	7	8	1	1
53	M	27	23	39	40	37	43	37	11	12	2	2	10	14	1	1	10	12	1	1	8	5	1	1	5	7	1	1
54	M	27	21	35	27	25	28	21	7	7	2	2	5	5	1	1	6	6	1	1	8	9	1	1	5	5	1	1
55	M	28	33	36	38	34	39	35	8	10	1	1	13	14	2	2	7	6	1	1	9	9	1	1	8	8	1	1
56	M	29	27	29	27	30	27	23	14	17	2	2	15	14	1	1	8	9	1	1	9	11	1	1	5	7	1	1
57	M	29	28	34	24	21	33	26	6	5	1	1	8	10	1	1	6	5	1	1	9	9	1	1	6	6	1	1
58	M	29	25	41	37	35	39	29	12	14	2	2	10	12	1	1	8	6	1	1	9	10	1	1	5	6	1	1
59	M	30	28	31	39	33	31	24	10	13	2	2	12	16	2	2	9	7	1	1	9	8	1	1	10	10	1	1

APPENDIX E (CONTINUED)

I.D. NO.	SEX	TRAIT 1	TRAIT 2	STATE 1	STATE 2	STATE 3	STATE 4	STATE 5	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5
61	M	33	32	27	34	00	29	23	6	12	1	1	7	9	1	1	5	5	1	1	6	10	1	1	5	5	1	1
62	M	33	32	35	36	35	37	31	9	17	2	2	10	13	2	2	7	8	1	1	10	12	2	2	8	8	1	1
63	M	33	33	35	33	31	30	33	8	9	2	2	7	8	1	1	6	6	1	1	6	5	1	1	9	5	1	1
64	M	35	25	31	26	25	26	20	8	15	1	1	6	7	1	1	5	5	1	1	7	7	1	1	5	5	1	1
65	M	35	24	31	36	31	24	22	10	11	1	1	11	10	1	1	7	8	1	1	8	6	1	1	6	6	1	1
66	M	36	28	40	44	39	39	39	7	15	1	1	8	12	1	1	8	7	1	1	8	7	1	1	8	5	1	1
67	M	37	36	33	33	29	27	24	9	17	2	2	10	11	1	1	9	7	1	1	7	7	1	1	7	6	1	1
68	M	38	36	38	46	44	40	41	13	14	2	2	17	18	2	2	12	13	1	1	12	15	2	2	10	10	1	1
69	M	38	40	41	43	39	38	37	9	11	1	1	12	11	1	1	7	7	1	1	9	9	1	1	9	11	1	1
71	M	40	50	45	58	55	50	43	14	15	2	2	13	13	1	1	6	8	1	1	7	5	1	1	7	8	1	1
72	M	40	27	26	37	26	24	20	7	9	2	2	16	14	2	2	6	5	1	1	5	6	1	1	5	5	1	1
73	M	43	42	55	49	45	47	45	16	16	2	2	18	20	2	2	14	15	2	2	14	13	2	2	15	14	2	2
74	M	43	40	30	44	37	39	34	6	7	1	1	8	11	2	2	5	5	1	1	5	5	1	1	5	5	1	1
75	M	45	40	35	41	35	35	24	8	11	2	2	11	15	2	2	8	6	1	1	6	7	2	2	6	6	1	1
76	M	46	46	54	47	41	44	43	14	17	2	2	9	12	2	2	9	8	1	1	11	12	2	2	10	10	1	1
77	M	47	43	54	50	39	32	26	14	16	2	2	12	13	1	1	10	11	1	1	6	7	1	1	10	12	1	1
78	M	48	48	55	40	32	31	22	9	11	1	1	7	8	2	2	8	7	1	1	7	7	1	1	5	5	1	1
79	M	48	46	47	50	46	47	47	9	11	1	1	12	15	2	2	7	9	1	1	7	12	1	1	11	12	1	1

APPENDIX F

PEARSON CORRELATION COEFFICIENTS FOR ALL VARIABLES

STRESS A1	STRESS A5	UNPL. A1	UNPL. A5	STRESS B1	STRESS B5	UNPL. B1	UNPL. B5	TRAIT 1	TRAIT 2	STATE 1	STATE 5	
											1.0	State 5
										1.0	.67	State 1
									1.0	.67	.55	Trait 2
								1.0	.85	.64	.40	Trait 1
							1.0	.20	.24	.40	.38	UnplB5
						1.0	.26	.14	.15	.34	.19	UnplB1
					1.0	.26	1.0	.20	.24	.40	.38	StressB5
				1.0	.22	.86	.22	.20	.18	.30	.22	StressB1
			1.0	.04	.47	.15	.47	.42	.46	.45	.47	UnplA5
		1.0	.30	.30	.32	.58	.32	.36	.41	.39	.33	UnplA1
	1.0	.28	.90	.01	.54	.08	.42	.42	.44	.42	.48	StressA5
1.0	.36	.84	.43	.58	.42	.65	.42	.41	.47	.56	.50	StressA1

APPENDIX G

A-State Anxiety for a Contrived Stressful Situation

The 2-way analysis of variance for state anxiety at lesson 4 revealed a significant F difference between groups of low and high trait anxiety.

TABLE G1

2-Way Analysis of Variance for State Anxiety

LESSON 4

VARIABLE	SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	F RATIO
State 4	Sex	196.38	1	196.38	2.71
	Group	921.21	2	460.60	6.36 ***
2-way interactions	Sex Group	23.96	2	11.98	0.16

*** Significant at the .001 level.

These results are consistent with the findings of O'Neil (1969) who found high A-Trait subjects respond with greater A-State intensity in a stressful situation than low A-Trait subjects.